

## MICROSCOPIC LIFE OF PONDS AND DITCHES.

Interesting Scientific Field is Pointed Out.

A PAPER READ BY DR. SLOGGETT.

SOME ACCOUNT OF THE MINUTE FORMS OF LIFE.

How the Student With Hand Lens or Microscope Can Seek Pleasure and Instruction Out of Doors.

The following abstract includes portions of the very interesting paper read before the Teachers' Normal Association, held in Honolulu. The paper was prepared at the request of Professor Wood by Dr. Sloggett, president of the Hawaiian Microscopical Society, and was read at the High School on the 16th inst.

"It may be premised that in the marshes and low districts around this city there are miles of ditches which have no perceptible current, only varying in height during wet and dry seasons, or in the salt marshes varying slightly under the influence of the tides, ditches in which vegetation appears to run wild, three-fourths of the surface being covered with the leaves of aquatic plants, or a green scum, and whose dark waters impregnated with the decay of plants, have sometimes an unmistakable odor. Such ditches swarm with living creatures too numerous but for the briefest notice in a short paper such as this; again, there are ponds and reservoirs, fish ponds, duck ponds, horse ponds, rice fields and the much in evidence taro patch.

"It is my object to introduce to your notice a number of very minute organized beings, not necessarily requiring a high power microscope to examine them, but that can be seen with an ordinary pocket lens, creatures whose whole world is a little puddle of water, who are born and die and leave behind them a progeny like themselves, and yet their place in creation may be represented by the punctuation point at the end of this sentence.

"Now, it is impossible for me to describe in the limits of this paper what objects of interest would be found even in a single dip into any semi-stagnant or still water in the environs of this city. I cannot even begin to name them, so numerous are they, but among the beautiful water lilies and lotuses and the humbler duckweeds, as well as among the large class of fresh-water algae, and attached to their leaves and stems the minute forms of animal and vegetable life will be found to swarm.

"The algae, known as cladophora and oscillaria, are to be found in great variety and beauty, and that most interesting object of pond life, the volvox, is quite plentiful here. Diatoms and desmids of rare form and startling beauty can be found in every taro patch. Diatoms, as you all, I expect, know, being minute plants, in life, moving freely by a swimming movement, or fixed to plants, and having as a characteristic feature an almost indestructible skeleton of the same substance as glass; that is to say, of silica, or flint—two thin plates of flint applied to each other by their surfaces and united by their marginal band. This is the type of structure in the diatom skeleton. The endochrome, or vital portion, is colored, but when the plant is dead and the endochrome is dissolved the skeleton still remains, indestructible as flint. Century after century these delicate skeletons remain, until they accumulate and form immense beds, consisting of the skeletons of myriads of diatoms. This is a fact that Richmond, in Virginia, is built on a stratum of diatomaceous remains, sometimes eighteen feet in thickness. There are other large tracts of fossilized diatomaceous found all over the world.

"Foraminifera, which swarm in these tropical seas, are among the simplest of all animal life, and their carbonate of lime skeletons are the most important factor in the formation of limestone rock, and chalk also is made up almost wholly of them, the microscope revealing this to us. These foraminifera can be found all round these islands, as well as in the ditches of the salt marshes, and will well repay for examination in the beauty of their form. The gray ooze or mud of the great ocean bottoms is composed largely of the skeletons of these foraminifera, and soundings of the great depths of the Atlantic, made during the voyage of the Challenger, in which now famous expedition I had the honor of serving as a lieutenant, showed that the ocean bottom, at the greatest depths, was covered with a thick and ever-increasing deposit of these dead foraminiferae.

"From what I have said, therefore, the ponds and ditches around Honolulu are a happy hunting ground for diatoms, and many new and beautiful varieties are awaiting the searcher in this field. The movements of the diatoms excited the wonder and curiosity of the earliest observers, and was a great argument in favor of their animal nature. However, we now know that they are aquatic plants, classed as unicellular algae, and in life usually colored a pale golden brown.

"Those who search in this field will also be rewarded by finding numbers of the great family of desmids, also algae of one cell, green in color and in such numbers as often to give a green tint to the water or mud when most prolific, and when found coating the bottom of a pool with a green stratum. They may be taken up with a spoon and placed in a wide-mouthed bottle, placing the bottle in the light, the sediment will sink to the bottom and the desmids rise to the light gradually, and then can be separated by decanting. If poured into a white soup plate the floating desmids may be taken out on the tip of a camel's hair pencil with the aid of a pocket lens, and thus the largest specimens may be isolated. In order to see them well, a microscope with an inch objective, or even a higher power, will be necessary.

"Now, though the desmids and diatoms look very much alike in many of the varieties, the desmids have no flint-like skeleton to leave behind them when they die as an almost imperishable record to mark where they have existed, as is the case with the diatoms. Now, moreover, to the student commencing to work with the microscope, either among the ponds and ditches or in any line he may feel an inclination for, it is, I am sure, better to take up some definite line and master it as far as possible, rather than to aimlessly wander among the immense varieties of minute animal and vegetable life, which he will find if he hunts in this field. To such a searcher, I would say, take up the study of the diatoms and you will derive endless pleasure and profit therefrom.

"There is an old story of the Greeks which narrates that there was a celebrated monster, to which the name of hydra was given, which infested the neighborhood of Lake Lerna. It had a hundred heads, according to Diodorus, and as soon as one was cut off, two immediately grew up, unless the wound was cauterized. It was one of the labors of Hercules to destroy this monster, which he accomplished. The modern hydra obtained its name from this fable, and at one time its story created as much excitement in the scientific world as that of the monster hydra could have done among the Greeks.

"The little animals to which this name applies are solely the inhabitants of fresh water and common enough in ponds and ditches adherent to aquatic plants. By placing portions of these plants in a vessel of water exposed to the light, it is probable that in half an hour we can see the hydra in his native element. No pocket lens will be required to find it, since it sometimes attains nearly an inch in length, but as the species most likely to be observed at first, is a green one, nearly the color of the plants to which it is attached, some little care will be required in looking for it, until its forms have become familiar. This little animal and all its operations may be watched in a glass vessel with the unaided eye.

"The hydra is mostly celebrated for its marvelous powers of reproduction. This is usually by budding from any part of the body, except the tentacles. A little tubercle rises on the body of the parent. This enlarges every hour, and ultimately tentacles appear at the apex, and no sooner are the young thus furnished than they commence catching prey on their own account whilst the parent and often may be seen the young one and often may be seen the young one and the old one struggling for and gorging different ends of the same worm together. Again, if the body is halved or cut into four or eight pieces, or even minced into forty, each piece in a short time grows into a perfect hydra. If the tentacles—the organs with which their existence might seem to depend—are cut away, they are reproduced, and the lopped off parts remain not long without a new body. You may even split the animal up and lay it out flat, like a membrane, with impunity—nay, it may be turned inside out—so that the stomach surface shall become the epidermis, and yet it will continue to live and enjoy itself.

"Time will only allow me to briefly touch on one other of these most interesting forms of life found in our ponds and waterways, namely the rotifers. The older naturalists recognized among aquatic animals a group of singular creatures, which appeared to them to differ from all others in bearing about their heads or upper extremities certain organs, constantly in motion, and resembling wheels. These they called 'wheel animalcules.' The modern name, rotifers, perpetuates the old romance of wheel bearers, and yet the organs are not wheels, but simply expanded discs, varying in form according to species, and having the margin fringed with one or more rows of delicate hairs, which by their continual and successive motion round the disc certainly had the appearance of rapidly revolving wheels. The concert is dead, but we have as inhabitants of ponds and ditches, as well as of slow-running streams and a few marine forms, a great number and variety of rotifers, which seem to bear a wheel on their heads. Water spiders, mites and water bears will be found in endless variety and strange form. The water fleas, so called because of their brisk, jerking motions, almost leaping in the water, being in reality a group of crustaceans allied to shrimps and lobsters, but differing in size, the very largest not exceeding a fifth of an inch. Their scientific name is Daphnia, first called Daphne, probably because in classic story Daphne was a daughter of the River Peneus, albeit the water fleas are rather the daughters of the horse pond than the river. They are only to be

found in fresh water, and oftenest where there is much duck weed; others in ponds where cattle come to drink. In such places they may be found in myriads nearly all the year round, and as they are often of a red or rusty color, they have been said to have tinged the water with the hue of blood.

"Any person who takes an interest in this subject will sooner or later obtain a microscope for him or herself, and the use of this marvelous instrument is not only the addition of new eyes, but an introduction to a new world. What better encouragement and direction, then, can possibly be given to the exercise of the observing powers of a child than to habituate him to the employment of this instrument upon the subjects which immediately surround him, and then teach him to search out novelties among those less immediately accessible. The more we limit the natural exercise of these powers the more we take him from the fields and woods, from river side and sea shore and shut him up in close schoolrooms and narrow playgrounds, limiting his attention to abstractions and cutting him off, even in his hours of play, from those sights and sounds of nature which are the appointed food of the youthful spirit, the more does it seem important that he should in some way be brought into contact with her, and that he should have his thoughts sometimes turned from the pages of books to those of creation and from the teachings of man to those of God."

### WAILUKU MEN TO HAVE PLEASURE CRAFT.

Two Ships Loading With Sugar—Dance in Honor of Miss Lowrie.

(Special Correspondence of The Republican.)

WAILUKU, July 21.—A company is being organized in Kahului for the purpose of purchasing a craft for deep-water sailing. It is proposed to obtain from the Coast a single-sticker of from 35 to 40 feet in length, fitted up as a pleasure craft and up to date in all respects. Already a number of applications from Wailuku aquatic men have been received by the originator of the scheme, who has sent to San Francisco for plans and specifications. The idea is viewed with delight by almost all the "boys," and the possession of such a craft will provide much-needed recreation for those whose tendencies run to water.

A delightful dance was given at Spreckelsville last night by Mr. and Mrs. Lowrie, in honor of their daughter, Clara, who leaves shortly for the Coast, where she will resume her studies. A large number of friends responded to the invitation and boarded a special train, which left Wailuku and ran through to Paia and thence to Spreckelsville.

The only vessels in port at this writing are the ship Emily Reed, Captain G. A. Baker, loading sugar for San Francisco, and the ship Bangalore, Captain Blanchard, loading sugar for Philadelphia.

The Robert Searles sailed in ballast for the Sound yesterday, and the Lurline, also in ballast, this afternoon for San Francisco.

### STEVENSON A HAS-BEEN.

That's What An Illinois Neighbor Says of Him.

"The nomination of Adlai E. Stevenson for running mate with Mr. Bryan will cause surprise in many circles where the gentleman is best known, said S. W. Nichols, editor of the Jacksonville (Ill.) Daily Journal, on his return from Hilo this morning.

"In the first place, anything connected with the late administration of Cleveland has no very savory odor in the nostrils of the average free-silver Democrat. Then, too, Mr. Stevenson is well along in years and comes perilously near being one of the 'has-beens,' a sort of back number. I live within eighty miles of his home in Bloomington, Ill., and since his retirement from the Vice-Presidency he has very seldom been heard from. It would certainly seem to an unprejudiced observer that the man most wanted for the nomination, the one who could add most strength to the ticket in the East didn't care to be sacrificed. It will also be interesting to see how he gets along with the labor unions, as he has had some experience in that line which has not added to his popularity. His nomination is on a par with that of Al Schuler of Illinois for Governor. The Democrats all over the State wanted, and even demanded Carter Harrison, Mayor of Chicago, but he, too, had something of which he felt reasonably certain—another term of the office he now holds—and he, too, refused to let the State convention be stampeded for him, much as the leaders and rank and file desired it."

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### GROWING HILO.

Improvements Made in Hawaii's Metropolis in Six Years.

Mrs. A. V. Inman has returned to town after a four-weeks' visit to Hilo. Prior to her trip she hadn't been in Hilo for six years. Mrs. Inman says she was greatly surprised in the many improvements made in the metropolis of Hawaii in six years. The town now has electric lights, a railroad, handsome business blocks and good roads.

MUST COME OFF HER PERCH. Suppose the sweet girl graduate does think she knows it all. She will learn better later on.—Chicago Record.

**Good Medicine for Children.**  
If you have a baby in the house you will wish to know the best way to check any unusual looseness of the bowels, or diarrhoea so common to small children. O. P. M. Holliday, of Des Moines, Ind., who has an 11-months-old child, says: "Through the months of June and July our baby was teething and took a running off of the bowels and sickness of the stomach. His bowels would move from five to eight times a day. I had a bottle of Chamberlain's Colic, Cholera and Diarrhoea Remedy in the house and gave him four drops in a teaspoonful of water, and he got better at once." For sale by all dealers and druggists. Benson, Smith & Co., general agents, Hawaiian Territory.

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